IN SEARCH OF INTELLIGENT ORGANIZATIONS

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Abstract : *The purpose of this paper is to search for the main characteristics of intelligent organizations. Intelligence is one of those concepts that everyone has in mind, but hardly few can define or explain it. Thus, it is even more difficult to extend this concept to organizations, and to talk about organizational intelligence. This paper tries to show the new dimensions of intelligence up to the organizational level, and the new characteristics such intelligent organizations may have. Basically, intelligent organizations are the ones which developed the capability to continuously adapt to changing and unpredictable environments. They are learning organizations in which the human capital, including the individual intelligence, has been integrated into a new cognitive structure at the organization level.*

Keywords: knowledge**,** intelligence, intellectual capital, organization, organizational intelligence.

1. Introduction

Organizations with intelligent people may be, or may be not, intelligent organizations. The way they pass from one status to the other is, at least partially, hidden in a black box. Our purpose here is to open the box and take a look inside. But, to start with, we have to look outside. The external environment of the organization is, nowadays, more and more dynamic, unpredictable, making it very difficult for companies to avoid turbulences that perturb their activities. That's why, in order to survive and, moreover, to gain and preserve their competitive advantage, the contemporary organization has to be skilled as to dynamically adapt to sudden external changes. At the interface between the internal field of forces and the external field of forces it should be maintained a dynamic equilibrium (Thompson and Strickland, 2001). Hence, the need to develop a dynamic and intelligent organizational model. In other words, companies have to organize for learning and for using the outcomes of learning (Brătianu, 2006; Kermally, 2002; Vasilache, 2006).

Of course, we can't push too far the analogy between human body structure and the organization structure, in terms of intelligence, and intelligence-driven actions. It is no longer acceptable to say that a top manager is the brain of an organization, whereas the employees are its hands. This way, an organization is certainly not going

to work in the knowledge era. But we can speak of *organizational intelligence*, defined as the integration result of all individuals intelligence. We would like to stress the fact that we consider an integration process and not a simple addition of all individuals intelligence. Integration generates synergy and increases the intellectual power capacity of organization. The task a manager has is to catch this entity, the intelligent organization, within the borders of a clear concept and to manage it well.

2. Organizational knowledge

In any organization there are two distinct levels of knowledge: *individual knowledge and organizational knowledge*. Individual knowledge belongs to each organization member and it can be accessed only with the individual acceptance. Individual knowledge is composed of *tacit* knowledge and *explicit* knowledge. Tacit knowledge can be obtained from the direct individual experience and it is stored within the unconscious zone of the brain. Let us consider for instance a child who tries to touch a hot plate with his fingers. It hurts and it might burn the finger skin. The child cannot understand the cause of this pain, but he acquired a new knowledge which will be used in his future behavior. This is a tacit knowledge. When his mother will explain to him about the risk of touching hot plates, the child receives explicit knowledge. It is a kind of rational and explained knowledge. Later on, he will be able to find this kind of knowledge in books, to get it from school or TV. Explicit knowledge can be detached from its owner and processed at the group or organizational level. At the individual level, each concept becomes clearly defined when there are both components, i.e. the tacit and the explicit knowledge.

Due to this exactly tacit dimension of knowledge Polanyi considers that we know much more than we think we know: *" I shall reconsider human knowledge by starting from the fact that we can know more than we can tell. This fact seems obvious enough; but it is not easy to say exactly what it means. Take an example. We know a person's face, and can recognize it among a thousand, indeed among a million. Yet we usually cannot tell how we recognize a face we know. So most of this knowledge cannot be put into words*" (Polanyi, 1983, p.4). Tacit knowledge is similar to practical knowledge and it is the "knowing what" face of a knowledge body. Explicit knowledge approaches the theoretical knowledge and it is the "knowing how" face of the same knowledge body.

By *organizational knowledge* we mean all the knowledge which can be integrated at the organization level from individual knowledge of its members, and from incoming knowledge fluxes from the external environment. Although the human resources of any organization is composed of the total number of its employee, the organizational knowledge is not the sum of all individual workers knowledge. Actually only the explicit or theoretical individual knowledge can be integrated into a new body of knowledge at the organization level. The tacit knowledge remains at the individual level due to its implicit nature. It can be used only as much as its holder can

do it, and only as much as its holder is a member of this organization. When any worker leaves the company, he takes with him all the tacit knowledge accumulated in time. Retaining this kind of knowledge constitutes a real problem for any organization.

Knowledge strategies become crucial for any accurate understanding of the way organizations work, and a mastering of the *dynamics* of knowledge can determine the competitiveness of an economic agent. When confronted with market globalization, industries often take to coordinating their knowledge to ensure its predominance over the others (Baumard, 2001). Organizations exchange information and knowledge with the external environment, which means to yield and to receive information and knowledge. Like the human body, an organization can identify, capture, filter and interpret information and knowledge coming from the external environment through something similar to the nervous system. By processing all of this knowledge and integrating it into its own knowledge basis an organization can accommodate its level of knowing with that required by a competitive capability. That means to accept the basic idea that we may consider a kind of cognitive system at the level of organization. Individuals may come and go, but the organization preserves its knowledge, its behavior and its values. In this perspective, organizational culture is a form of the organization knowledge basis.

By comparison with the potential and kinetic energy from Physics, we may consider that at the organization level there is *potential* and *kinetic* knowledge. The potential knowledge is represented by all the information and knowledge existing in documents and in the structural elements of the organization itself. The kinetic knowledge is the working component able to generate decisions and actions. In Physics, any variation of the kinetic energy generates work in a certain amount. Also, the energy and work exchanges between a system and its environment are in a given ratio, according to the thermodynamic laws.

In Management, we may say that *any exchange of information between an organization and its environment modifies the knowledge state of organization and contributes to the decision making process* (Brătianu, 2006a). Actually, any decision making process is generated as a result of knowledge variation, and any implementation of these made decisions results in action. Thus, the knowledge dynamics is related to the decision making process, and to action generation. Since this is a quite new field of research, we only postulate this relationship without having a quantitative expression of it. Measuring knowledge and its variation it constitutes a real difficulty because they are strongly nonlinear quantities.

3. Knowledge dynamics

In any organization we may consider a given knowing state based on the knowledge quantity and quality existing in a certain moment of time. This knowing state can be changed as a result of knowledge variation at the organizational level caused by different knowledge processes: generation, acquisition, integration,

codification, sharing, storage, retrieval, transformation from one form into another. Nonaka and Takeuchi demonstrate in their book that Japanese companies obtained such a great success on the international market due to their capabilities of processing information and generating new knowledge: "*By organizational knowledge creation we mean the capability of a company as a whole to create new knowledge, disseminate it through the organization, and embody it in products, services, and systems. Organizational knowledge creation is the key to the distinctive ways that Japanese companies innovate. They are especially good at bringing about innovation continuously, incrementally, and spirally*" (Nonaka and Takeuchi, 1995, 8, p.3).

Knowledge acquisition. Any organization can be considered as an open system with respect to information. Thus, between the internal and the external environment there is a continuous exchange of information. By processing the incoming information flux the organization acquires new knowledge with respect to its knowing state. Also, within the organization there is a process of knowledge creation, especially by transforming tacit knowledge into explicit knowledge at the individual level and then by sharing and integrating this new knowledge at the organization level. Knowledge acquisition is important in improving the knowing state, by reducing the complexity and uncertainty of the decision making process. The most direct and often most effective way to acquire knowledge is to buy it – that is, to buy an organization or hire individuals that have it. Increasingly, companies acquire other companies specifically for their knowledge. They are willing to pay a premium over the market value of the company purchased because of the value they expect to get from integrating that new knowledge to their own knowledge stock. For instance, IBM purchased in 1995 Lotus. IBM paid $3.5 billion, which was 14 times Lotus's book valuation of $250 million. Clearly, IBM did not pay that amount of money for the current revenue generated by Notes and other Lotus products or for Lotus's manufacturing and sales capabilities. The $ 3.25 billion premium IBM paid represents their appraisal of Lotus's unique knowledge of Notes and other collaborative software applications (Davenport and Prusak, 2000).

Knowledge transformation. Taking into account the two kinds of knowledge (i.e. tacit and explicit), and all possible transformations between them we can get a transformation matrix having the following possible processes (Nonaka and Takeuchi, 1995):

Socialization: Tacit knowledge >> Tacit knowledge .
Externalization: Tacit knowledge >> Explicit knowledge.
Internalization: Explicit knowledge >> Tacit knowledge.
Combination: Explicit knowledge >> Explicit knowledge.

Each of these above processes can be performed between individuals, groups or individuals and groups in different patterns. Transformation implies also sharing and transfer. It is very important to show the fact that there is a great difference between sharing or transferring tangible objects and sharing or transferring information and knowledge. Let us consider two individuals. In the initial state of the process one of them has two books and the other has none. The individual having two books gives

one book to the other. The final result of this transferring process, the first person has one book and the second person has one book. The first person decreased his quantity of books by one, while the second person increased his quantity of books by one. On the whole, the total number of books remains constant. We say that during the process the mass has been conserved, or that the transferring process respects the mass conservation law. In Physics we have three fundamental laws: conservation of mass, conservation of momentum and conservation of energy. In knowledge dynamics none of these laws can be applied.

Let us consider two individuals A and B, having two different knowledge levels K(A) and K(B), respectively. Let us say that K(A) > K(B). Then, a transfer of knowledge is possible from person A to person B. As a result of this sharing process a quantity Q of knowledge has been transferred from A toward B. The final state of knowledge for person A is now K(A), and for the person B is K(B)+Q. Unlike tangible objects, knowledge can be shared without loosing it. Thus, even A gave the quantity Q of knowledge to B, its level of knowledge remained the same, while the level of knowledge for B has been increased. During this sharing process the total quantity of knowledge for both individuals has been increased and its quality changed too. The law of conservation does not apply anymore. Research is open to new findings and law formulations.

However, from Thermodynamics we can be inspired by the law of heat exchange which states that heat is always flowing naturally from the body with higher temperature toward the body with the lower temperature. Similarly, we may say that knowledge can be transferred only from a person with a higher level toward a person with a lower level. Unfortunately, we do not know yet how to measure a knowledge level and thus, it is really hard to evaluate the amount of any information exchanged between two or more individuals. This above observation may be considered for the moment only as a qualitative description of knowledge transfer process. In management, communication is not identical with knowledge transfer. Two persons may talk about different things, yet no net knowledge transfer can take place unless there is a clear difference between their knowing levels.

From management point of view the most difficult transfer process is socialization, since tacit knowledge cannot be conveyed using verbal language. Being out of organization control, the tacit knowledge remains at the will and power of individuals. Japanese companies make great efforts to create special contexts for their employees in order to break institutional barriers and to stimulate sharing of this tacit knowledge. *"Originated interaction is how individuals share feelings, emotions, and experiences. Individual face-to-face interaction is the only way to capture the full range of physical sensations and emotional reactions that are necessary for transferring tacit knowledge. Individuals sympathize and/or emphasize with others, actions that inspire the care, trust, and commitment that allow for knowledge sharing"* (Von Krogh, Ichijo, and Nonaka, 2000, p.181).

It is interesting to consider a knowledge transfer cycle, starting with the tacit >> explicit transformation, continuing with explicit >> explicit sharing , and ending up

with explicit >> tacit transformation. While for organizations it is important the sequence of the first two processes mentioned above, for the individuals it is important the last process. Knowledge management must find out new ways of structuring and using these processes in order to increase the competitive power of organization. In the same time new paradigms must be developed in order to measure knowing and knowledge levels and to express quantitatively the knowledge dynamics.

4. Organizational intelligence

Organizational intelligence is a multilevel intelligence and its very existence generates the framework of the intelligent organization. Glynn considers to be important for such an organization at least three characteristics, i.e. the intelligent organization is: *a learning organization; a market-driven organization; an innovative organization* (Glynn, 1996). Some researchers tie this attribute, the intelligence of an organization, with market knowledge and environmental scanning. Jaworski and Kohli claim that market orientation generates intelligence and also gives raise to activities of intelligence dissemination among various departments (Jaworski and Kohli, 1993). Day, in his turn, speaks of three specific activities that an intelligent organization performs: the outside in (i.e. integrating exterior knowledge), the inside out (i.e. exporting products and services on the market) and the spanning (i.e. product/service innovation). Actually, he identifies the same three characteristics as Glynn, but his formulation is somehow different (Day, 1994).

After a thorough analysis of these literature approaches, we would like to promote a knowledge processing framework generated by the need of reducing the environmental entropy. Thus, we define the *organizational intelligence* as being *the organizational capacity of processing knowledge in order to get the best solutions for its survival and success in a competitive environment.* Organizational intelligence is a result of an integration process of all individuals intelligence, weighted by their relative importance in the decision making process within the organization. That means a nonlinear approach of the contribution each member may have and a structured process of integration which reflects the functional structure of the given organization. For instance, in a rigid structured and dictatorial lead organization the contribution of its top management is overwhelming. In such an organization, innovation and knowledge generation is very limited and the decision making process is concentrated in the power of very few individuals. The organizational intelligence is directly proportional with the top management intelligence. On the other hand, in a company with a strong innovative organizational culture and a participative management, the decision making process is rather distributed and it reflects a large participation from all the employee. In such a company, the organizational intelligence has a much larger foundation and a more powerful integration result. The organizational thinking model is dynamic, nonlinear and probabilistic (Bratianu and Murakawa, 2004).

5. Characteristics of intelligent organizations

Any organization has developed a kind of organizational intelligence. However, if the process of integrating individuals intelligence is very weak as a result of a non-stimulating organizational culture, and if the integral result reflects only the top management participation, then the organization has a very low level of intelligence. At the other extreme, if the integration process is very strong and the synergy effect is powerful, then the organization has a very high level of intelligence. Thus, the simple existence of some intelligent employees within the company does not necessarily means a high level of organizational intelligence. The following are some important characteristics of the intelligent organizations.

The organization's ability to grasp as much as possible of the employees' tacit knowledge. This means that the intelligent individuals have to interact in a very significant way. And the relational capital (Roos et al., 1997) they create becomes a component of the intellectual capital the organization, as a whole, administrates. A key-word in understanding this concept of relational capital is *trust*. Here, we go back to Goleman and his emotional intelligence (Goleman, 1995). Obviously, employees know more than they are able to tell. So, an intelligent organization, a structure which functions as a decision-maker under uncertainty and risk, has to put at work all the emotional tools that help intelligences congregate into the organizational intelligence of the company.

The ability employees have to commit themselves to double-loop learning (Argyris, 1999). The alternative to double-loop learning is single-loop learning, which means, basically, problem-solving. Single-loop learning relies on deterministic thinking. Or, let's say, on "conditioned reflexes". For instance, a worker knows that if the temperature of the oven is 300 degrees Fahrenheit, he has to put a certain piece inside. This stays for single-loop learning, *i.e.* fulfillment of a task under invariant (or quasi-static) conditions. But if the same worker begins to wonder why that particular piece has to be moulded at 300 degrees Fahrenheit and to ask himself "isn't there another temperature that might improve the result?" then he is committed to double-loop learning. The organization itself can single-loop or double-loop learn. In other words, it may develop some "programs" which fit into a given set of conditions and which can be used, repetitively, whenever a "standardized" problem occurs. Or, on the contrary, it may choose to adapt to unpredictable chains of events, and to develop inquires that question the mechanisms of the problems, not only solutions that relieve the symptoms. This would be, in a nutshell, the difference between any organization (whose employees are more or less intelligent) and an intelligent organization. The later, even when confronted with cause-effect patterns, will skip the deterministic way of thinking and will try to rearrange its organizational structure so that the problem is, in the long run, eliminated (Senge, 1999).

The organization's capacity to adapt to rapidly changing and unpredictable environments. Environmental changes implicate a new way of designing the organization and its functioning. According to Choo and Bontis (2002), the way an organization faces external modifications goes through five phases: intake and orientation; diagnosis and determination of objectives; realization of the new objectives; evaluation; follow-up. The last two stages are of extreme importance. During the evaluation period, an organization that has learned something new learns if the learning outcomes were satisfactory, while in the follow-up stage, it learns how to be able to learn in the future.

The organization should be organic. The intelligent organization should have the form of an adhocracy, meaning that its people are not encouraged to obey, but to cooperate and create. The organic model is taken from biology, and it is much more flexible than the mechanical model (Mintzberg, 1997). This way, the organization assumes the necessary premises for learning and applying learning.

The organization should develop its intellectual capital. The multitude of definitions and approaches to intellectual capital show their importance on the one hand, but, in the same time, the difficulty of expressing the intangible. The origin of this field appeared with the acknowledgement of the differences between the book value of the firm and its market value. John Kenneth Galbraith seems to have coined the concept of "intellectual capital" in the late 60's. He suggested that intellectual capital means intellectual action more than just knowledge or pure intellect. Therefore, it is a form of value creation and an asset in the traditional sense (Roos et al., 1997). Stewart (1999, p.XI) defines intellectual capital as being "*intellectual material – knowledge, information, intellectual property, experience – that can be put to use to create wealth"* . A very simple, but comprehensive definition is the one given by Leif Edvinsson and Pat Sullivan: "*Knowledge that can be converted into value"* (Sveiby, 2001). As it can be seen , these definitions are not very specific and they cannot be, due to the nature of intellectual capital. Therefore, we may consider these definitions as being only a starting point in any conceptual development concerning the intellectual capital. The most used structuring of the intellectual capital found in the literature is the following: human capital, structural capital and customer capital (Steward, 1999).

Human capital consists of knowledge, experience, competence, intelligence, creativity, cultural values and attitudes. Structural capital includes management relationships, organization structure, renewal and development. The relationship capital refers to the marketing relationships and it is very important for any market driven company. An intelligent organization, whose most valuable asset is the intellectual capital, should foster each of these components, in order to mobilize them well. The evolution of the organizational memory encompasses three stages. The short-term organizational memory can last for three to five years. Then, the medium-

term memory comes into action, for the next five years. Finally, the long-term organizational memory can be equaled with the company's strategy.

The future trend for intelligent organizations is the ability to preserve the equilibrium between the knowledge pools and the knowledge flow. The knowledge flow is more connected with intelligence, and it obeys some basic laws, which adapt Darcy's mathematical law for the fluid flows:

- Knowledge flows faster through a more permeable organization.
- Tacit knowledge is stickier than explicit knowledge.
- Knowledge flow through an organization can .be improved by applying pressure (*i.e.*, competition, excellence standards).

The natural trend, in each organization, is to switch from solid management to fluid management. In other words, to dispose of wider spans of control, and to distribute the decision making process, in order to stimulate employees involvement.

6. Challenges for the Romanian organizations

Of course we are interested in the place Romania holds in this discussion about intelligent organizations. Is the intelligent organization, in Romania, a "will be"? Partially yes, as strategic management and the proper administration of intellectual capital have been done in a very unstructured way. So, the first step for Romanian organizations is to develop their intellectual capital, and this can be done in the following ways, which have to be assumed as priorities:

a) train professionals in the field of organizational learning, able to trigger and to manage this process;
b) rethink the hierarchies and the organizational charts, in such a way that they allow double-loop learning;
c) change the organizational culture.

The organizational culture is a part of the intellectual capital of any company (to be more precise it is part of the structural capital of a company). The culture refers to the set of values, norms, standards for behavior, and shared expectations that develop within a certain organization in time. The longer the history of the company, the stronger is the organizational culture. It influences the way in which individuals, groups and teams interact with each other and cooperate to achieve organizational goals.

Effective knowledge management is supported by an organizational culture that will facilitate the sharing and creation of knowledge. Do Romanian companies have such cultures? Probably a positive answer cannot be done, except for very few companies. The creation of such cultures will be a very difficult task, since in many Romanian companies the level of bureaucracy is very high. Although a lot of companies sustain the idea of a participative management, sometimes the management

of Romanian companies is strongly dominated by control, sometimes excessive and inadequately applied. Moreover, organizational learning, that is very important in a knowledge based company, requires a culture based on free communication, team spirit and trust.

We were speaking earlier about the importance of a creative organizational environment based on trust and that should stimulate the creative flow of knowledge. Creativity means initiative, crossing of boundaries, taking risks and accepting mistakes as stepping stones to move forward. In a blame culture that unfortunately characterizes many of the Romanian companies, creativity is just blocked. The challenge is therefore to change completely such an organizational culture into a stimulating and rewarding one. It is a very slow and rather difficult process but it should be done if the companies should survive in the coming future.

The most difficult challenge is to change the organizational culture of the Romanian companies which has been based on linear and deterministic thinking, and on a quite homogeneous values system. It is necessary to switch on nonlinear and random thinking models (Bratianu and Murakawa, 2004). Also, it is important to develop trust among employees and to base the motivation system on the knowledge value. Developing knowledge dynamics at the organizational level and increasing socialization and combination will contribute in a significant way to the process of knowledge and know-how integration (Bratianu, 2006).

7. Conclusions

Although the field of knowledge management is relatively new to most Romanian companies, they can no longer ignore it. The capability of a company to manage its intangible assets are by far more important in their success than the investment in tangible assets and performing classical operational management of these tangible assets. The new rules in the new economy might require some changes in the way a business operates. Unless they know the challenges they have to face and find solutions to deal with such challenges, most companies will have a difficult time competing or even surviving in a dynamic business environment.

The future belongs to intelligent organizations due to their capacity to adapt to the ever changing external business environment. Increasing competition and the threats of new entrants or of the substitute products will determine companies to develop their organizational intelligence, as an integral result of processing all individuals intelligence. For any company to become intelligent it is important to have many intelligent employees, but it is not enough. It is necessary to develop a new organizational culture able to integrate all of these individuals intelligence.

The future direction in learning organizations is to focus on double-loop learning, on asking questions instead of problem solving, and to develop as many

connections as possible between the human and the structural capital, in order to take profit of the tacit knowledge of the employees.

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